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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,166	12/27/2006	Uwe Gaertner	095309.56877US	2033
23911	7590	10/29/2007	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			COLEMAN, KEITH A	
ART UNIT		PAPER NUMBER		
4175				
MAIL DATE		DELIVERY MODE		
10/29/2007		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/552,166	GAERTNER, UWE	
	<b>Examiner</b>	<b>Art Unit</b>	
	Keith A. Coleman	4175	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 7-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 7-25 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 11 October 2005 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/11/2005.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa (US Patent No. 6,138,638) in view of Hochstrasser et al. (US Patent No. 6,990,954).

With regards to claims 7 and 16, the patent to Morikawa discloses all the limitations of the claimed subject matter, including a quantity of fuel is metered in as a function of the operating point during a working cycle (See Figure 16) except wherein the quantity of fuel which is metered in is injected into the combustion chamber in such a manner that a position of the combustion center of gravity is at a defined crank angle position independently of the operating point of the internal combustion engine wherein the quantity of fuel which is metered in is injected into the combustion chamber in such a manner that a position of the combustion center of gravity is at a defined crank angle position independently of the operating point of the internal combustion engine. The patent to Hochstrasser et al. discloses wherein the quantity of fuel (Col. 1, Line 33-35) which is metered in is injected into the combustion chamber in such a manner that a position of the combustion center of gravity (KW, Col. 2, Lines 59-60) is at a defined crank angle position (Col. 2, Lines 40-45) independently (Col. 2, Lines 49-52) of the operating point of the internal combustion engine wherein the quantity of fuel (Col. 1, Lines 33-35) which is metered in is injected into the combustion chamber in such a manner that a position of the combustion center of gravity (KW, Col. 2, Lines 59-60) is at a defined crank angle position (Col. 2, Lines 40-45) independently (Col. 2, Lines 49-52) of the operating point of the internal combustion engine (via computer program, Col.

2, Lines 61-68 through Col. 3, Lines 1-9). Since Morikawa explicitly states the ECU 50 (Col. 31, Lines 49-51) has a CPU 51 (Col. 32, Lines 49-63) that stores control programs in ROM 52 (Col. 32, Line 52), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the ECU of Morikawa with a combustion center or gravity program in view of the teaching to Hochstrasser et al., in order to optimize torque computations (Col. 2, Lines 1-4).

5. Claim 8-15 and 16-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa (US Patent No. 6,138,638) in view of Hochstrasser et al. (US Patent No. 6,990,954) as applied to claims above, and further in view of Oosuga et al. (US Patent No. 4,596,220).

With regards to claims 8, 17, and 18, the combination of Morikawa and Hochstrasser et al. discloses all the limitations of the claimed subject matter, including Hochstrasser et al. disclosure of wherein a current position of the combustion center of gravity (KW, Col. 2, Lines 59-60) is determined as a function of a recorded pressure profile in the combustion chamber (via exhaust-gas pressure, Col. 3, Lines 40-44), except the pressure profile in the combustion chamber preferably being recorded by means of a sensor. Oosuga et al. discloses a sensor (54, Col. 9, Lines 9-11). Since Hochstrasser et al. discloses taking exhaust flow pressure into account (Col. 3, Lines 40-44) and Morikawa also takes into account cylinder pressure (Figure 16) and has an exhaust sensor (36, Col. 32, Line 20-23) that measures air/fuel ratios (Col. 30, Lines 52-

58), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the combustion chamber of Morikawa with a pressure sensor in view of the teaching to Oosuga et al., in order to detect combustion pressure in the cylinder (Col. 9, Lines 9-11).

With regards to claims 9,13, 19 and 23, the combination of Morikawa and Hochstrasser et al discloses all the limitations of the claimed subject matter including Hochstrasser et al. disclosure of wherein the current position of the combustion center of gravity (KW, Col. 2, Lines 59-60) is determined as a function of a crank angle position (Col. 4, Lines 16-19) and Morikawa disclosure of a maximum cylinder pressure is recorded in the combustion chamber (See Figure 16). Since Morikawa explicitly states the ECU 50 (Col. 31, Lines 49-51) has a CPU 51 (Col. 32, Lines 49-63) that stores control programs in ROM 52 (Col. 32, Line 52) and has an exhaust sensor (36, Col. 32, Line 20-23) that measures air/fuel ratios (Col. 30, Lines 52-58), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the ECU of Morikawa with a combustion center or gravity program that finds wherein the current position of the combustion center of gravity is determined as a function of a crank angle position at which a maximum cylinder pressure is recorded in the combustion chamber in view of the teaching to Hochstrasser et al., in order to optimize torque computations (Col. 2, Lines 1-4).

With regards to claims 10 and 20, the combination of Morikawa and Hochstrasser et al discloses all the limitations of the claimed subject matter including Hochstrasser et al. disclosure of wherein the current position of the combustion center of gravity (KW, Col. 2, Lines 59-60) is determined as a function of a fuel injection duration (Col. 1, Lines 24-27), a charge mass in the combustion chamber (i.e. air mass, Col. 1, Lines 34-35) speed of the internal combustion engine (Col. 1, Lines 34-36). As to the start of fuel injection, since Morikawa explicitly states that computations are done between S19 to S22 at fuel injection start-up (S19 to S22, Col. 40, Lines 25-31) and has an exhaust sensor (36, Col. 32, Line 20-23) that measures air/fuel ratios (Col. 30, Lines 52-58), and Hochstrasser et al. does instantaneous engine adjustments (Col. 1, Lines 32-33), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the program of either Morikawa or Hochstrasser et al. with the current position of the combustion center of gravity determined as a function of a fuel injection start-up, in order to find abnormalities and start computations (Col. 39, Lines 65-67 through Col. 40, Lines 1-4 from Morikawa)

With regards to claims 11,14, 21 and 24, the combination of Morikawa and Hochstrasser et al discloses all the limitations of the claimed subject matter including Hochstrasser et al. disclosure of wherein an exhaust gas recirculation quantity (Col. 1, Line 50, Col. 1, Line 63, Col. 3, Lines 23-34) for setting a defined oxygen concentration in the combustion chamber is set as a function of the combustion center of gravity (KW,

Col. 2, Lines 59-60). As to a defined oxygen concentration, Hochstrasser et al. explicitly discloses that the inert gas rate is computed based on instantaneous air charge and exhaust gas pressure (Col. 3, Lines 40-45) and further discloses that desired quantities can be found (Col. 4, Line 23, Col. 4, Lines 40-44). In addition, Morikawa discloses an exhaust sensor (36, Col. 32, Line 20-23) that measures air/fuel ratios (Col. 30, Lines 52-58),

With regards to claims 12,15, 22, and 25, the combination of Morikawa and Hochstrasser et al discloses all the limitations of the claimed subject matter including Hochstrasser et al. disclosure of wherein the position of the combustion center of gravity (KW, Col. 2, Lines 59-60) is set by varying the fuel injection (Col. 1, Lines 24-27).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Matsunaga et al. (US Patent No. 7,218,99) and Caterpillar Presentation (Online Non-Patent Publication) shows the current state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith A. Coleman whose telephone number is 571-270-3516. The examiner can normally be reached on Monday through Friday between 5:30-3 Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrence Till can be reached on (571) 272-1280. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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